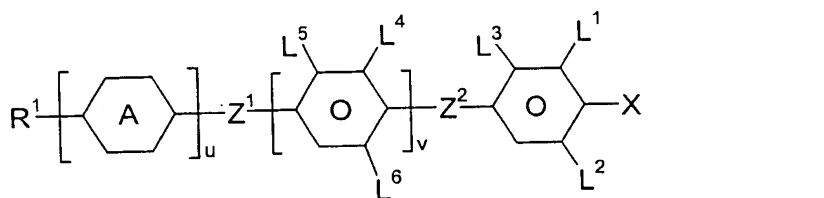


Patent Claims

1. A liquid-crystalline medium based on a mixture of polar compounds, which comprises one or more compounds of the formula I

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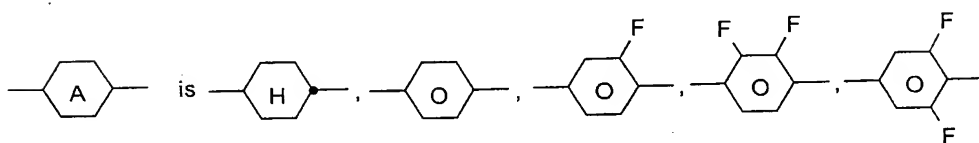
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in which

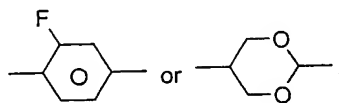
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R^1 is an alkyl radical having from 1 to 12 carbon atoms which is unsubstituted, monosubstituted by CN or CF_3 or monosubstituted to perhalo-substituted by halogen, where one or more CH_2 groups in these radicals, in each case independently of one another, are optionally replaced by $-O-$, $-S-$, --- (cyclobutane ring) --- , $-CH=CH-$, $-C\equiv C-$, $-CO-$, $-CO-O-$, $-O-CO-$ or $-O-CO-O-$ in such a way that O atoms are not linked directly to one another,

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L^{1-6} are each, independently of one another, H or F,

Z^1 and Z^2 are each, independently of one another, $-COO-$ or $-CF_2O-$, where $Z^1 \neq Z^2$,

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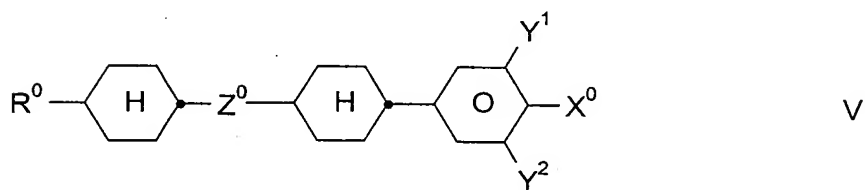
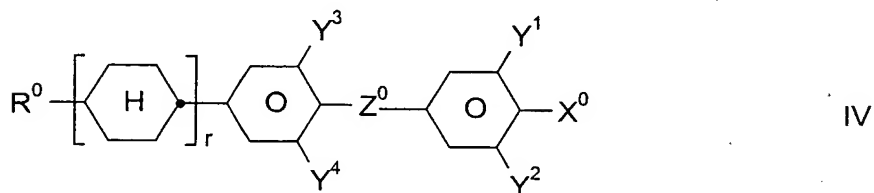
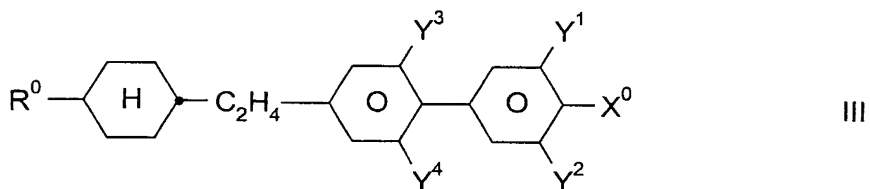
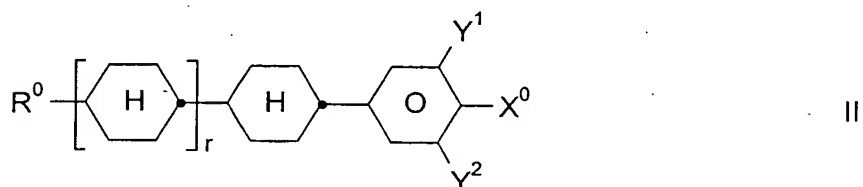
X is F, Cl, CN, OCN, NCS, SCN, SF_5 , an unsubstituted alkyl or alkoxy radical, a halogenated alkyl radical, a

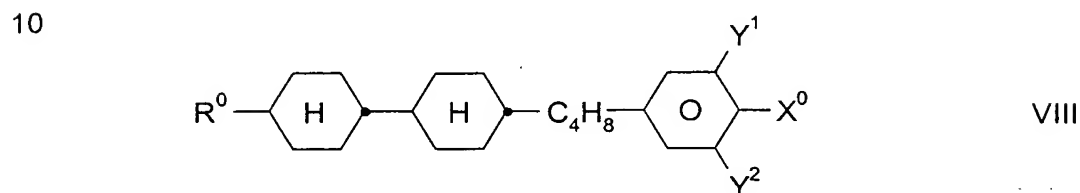
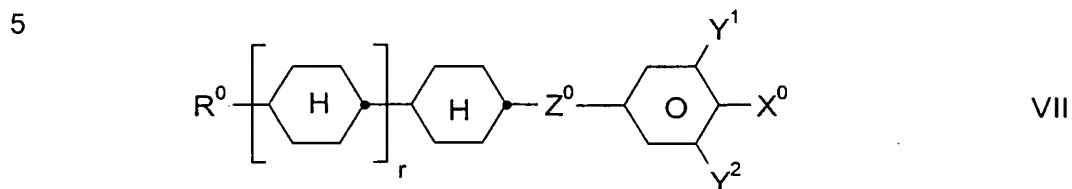
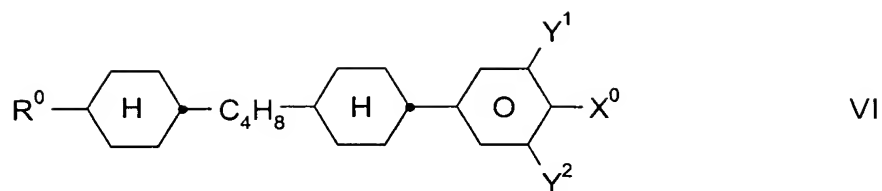
halogenated alkenyl radical, a halogenated alkoxy radical or a halogenated alkenyloxy radical having up to 6 carbon atoms and up to perhalo substitution,

u is 1 or 2, and

v is 1 or 2.

2. A medium according to Claim 1, which additionally comprises one or more compounds selected from the group consisting of compounds of the formulae II, III, IV, V, VI, VII and VIII:





in which the individual radicals have the following meanings:

R^0 : n-alkyl, alkoxy, oxaalkyl, fluoroalkyl or alkenyl, each having up to 9 carbon atoms,

X^0 : F, Cl, halogenated alkyl, halogenated alkenyl, halogenated alkenyloxy or halogenated alkoxy having from 1 to 6 carbon atoms,

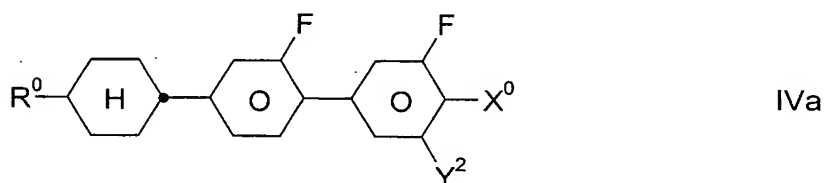
Z^0 : $-\text{C}_2\text{H}_4-$, $-\text{CH}=\text{CH}-$, $-\text{CH}_2\text{O}-$, $-\text{OCH}_2-$, $-\text{COO}-$, $-\text{OCF}_2-$, $-\text{CF}_2\text{O}-$, $-\text{CF}=\text{CF}-$, $-\text{C}_2\text{F}_4-$, $-\text{CH}_2\text{CF}_2-$ or $-\text{CF}_2\text{CH}_2-$,

Y^1 and Y^2 : each, independently of one another, H or F, and

r : 0 or 1.

3. A medium according to Claim 2, wherein the proportion of compounds of the formulae I to VIII together in the mixture as a whole is at least 30% by weight.

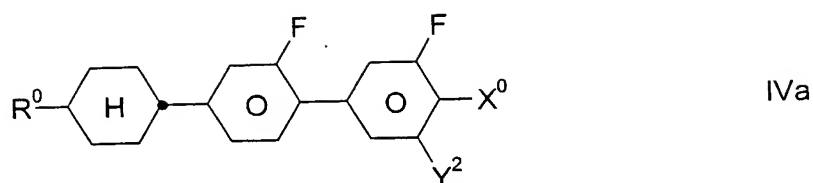
4. A medium according to Claim 1, wherein the proportion of compounds of the formula I in the mixture as a whole is from 1 to 50% by weight.
5. A medium according to Claim 2, wherein the proportion of compounds of the formula I in the mixture as a whole is from 1 to 50% by weight.
6. A medium according to Claim 2, wherein the proportion of compounds of the formulae II to VIII in the mixture as a whole is from 20 to 80% by weight.
7. A medium according to Claim 1, which further comprises one or more compounds of the formula IVa



in which the individual radicals have the following meanings:

- R^0 : n-alkyl, alkoxy, oxaalkyl, fluoroalkyl or alkenyl, each having up to 9 carbon atoms,
- X^0 : F, Cl, halogenated alkyl, halogenated alkenyl, halogenated alkenyloxy or halogenated alkoxy having from 1 to 6 carbon atoms, and
- Y^2 : is H or F.

8. A medium according to Claim 2, which further comprises one or more compounds of the formula IVa



5 in which the individual radicals have the following meanings:

R^0 : n-alkyl, alkoxy, oxaalkyl, fluoroalkyl or alkenyl, each having up to 9 carbon atoms,

10 X^0 : F, Cl, halogenated alkyl, halogenated alkenyl, halogenated alkenyloxy or halogenated alkoxy having from 1 to 6 carbon atoms, and

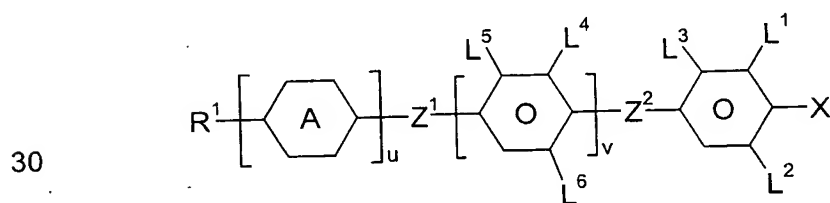
15 Y^2 : is H or F.

9. A medium according to Claim 2, comprising a compound of one of formulae II-VIII wherein X^0 is F, $OCHF_2$ or OCF_3 , and Y^2 is H or F.

20 10. A medium according to Claim 7, comprising a compound of formula IVa wherein X^0 is F, $OCHF_2$ or OCF_3 , and Y^2 is H or F.

11. A medium according to Claim 1, which comprises a compound of the formula I wherein R^1 is straight-chain alkyl.

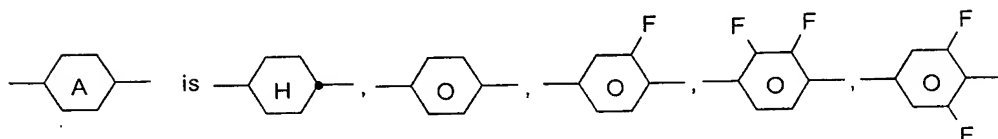
25 12. A liquid-crystalline compound of the formula I:



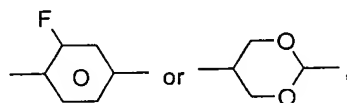
in which

R^1 is an alkyl radical having from 1 to 12 carbon atoms which is unsubstituted, monosubstituted by CN or CF_3 or monosubstituted to perhalo-substituted by halogen, where one or more CH_2 groups in these radicals, in each case independently of one another, are optionally replaced by $-O-$, $-S-$, --- (cyclobutane ring) --- , $-CH=CH-$, $-C\equiv C-$, $-CO-$, $-CO-O-$, $-O-CO-$ or $-O-CO-O-$ in such a way that O atoms are not linked directly to one another,

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L^{1-6} are each, independently of one another, H or F,

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Z^1 and Z^2 are each, independently of one another, $-COO-$ or $-CF_2O-$, where $Z^1 \neq Z^2$,

25

X is F, Cl, CN, OCN, NCS, SCN, SF_5 , an unsubstituted alkyl or alkoxy radical, a halogenated alkyl radical, a halogenated alkenyl radical, a halogenated alkoxy radical or a halogenated alkenyloxy radical having up to 6 carbon atoms and up to perhalo halogenation,

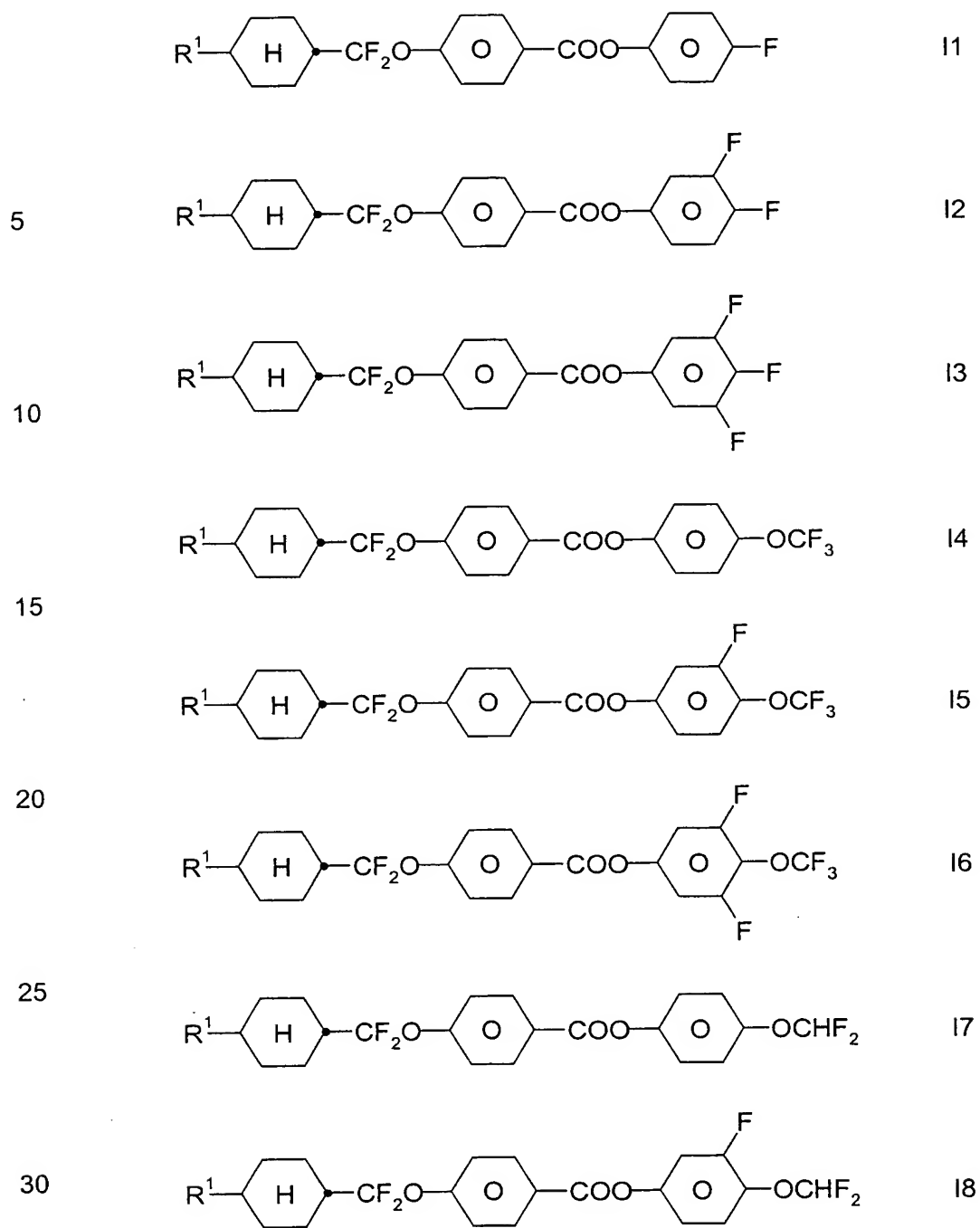
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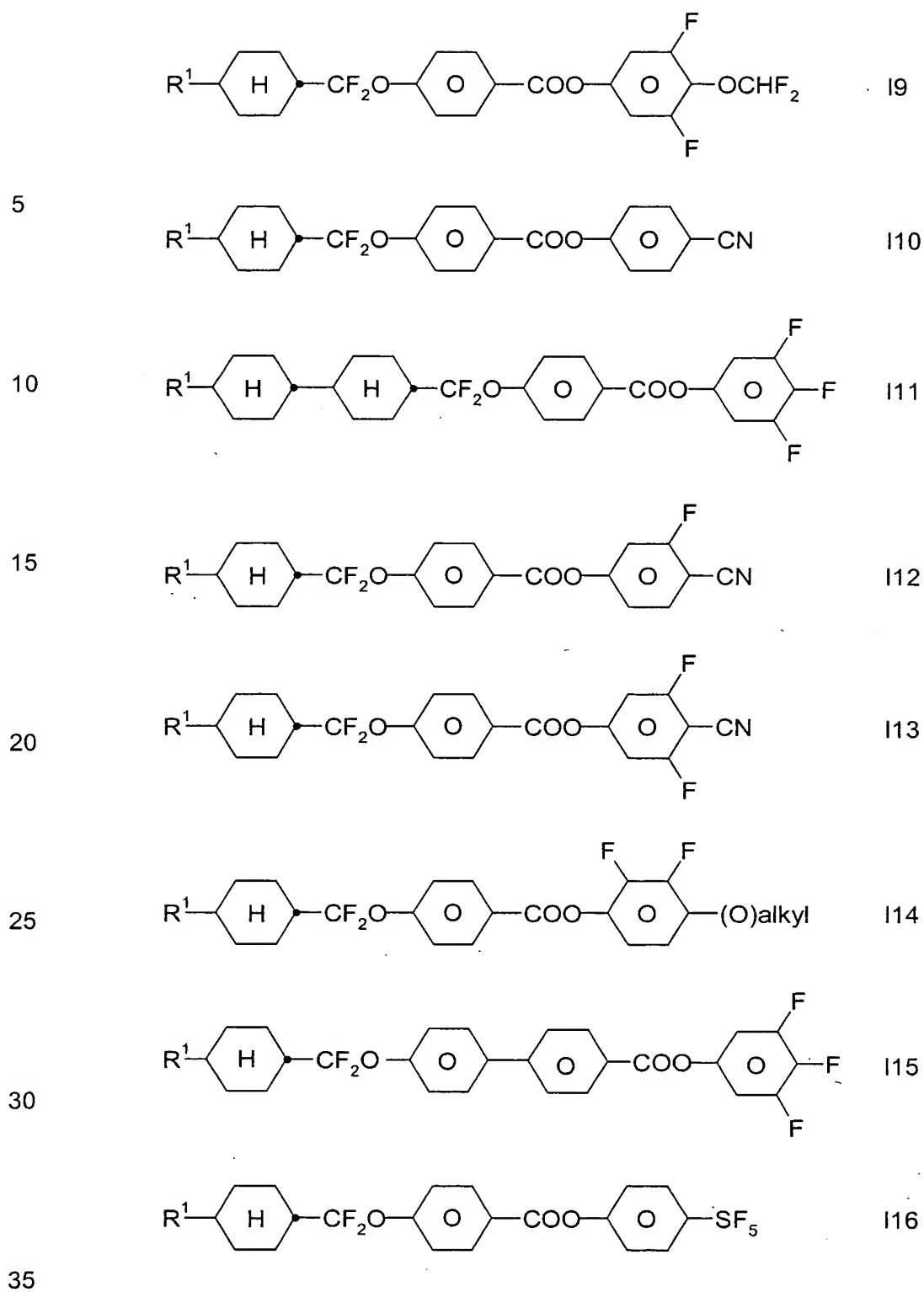
u is 1 or 2, and

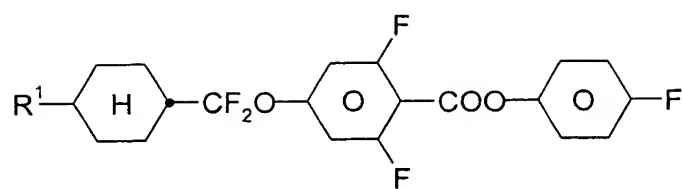
v is 1 or 2.

13. A liquid-crystalline compound of one of the formulae I1 to I32

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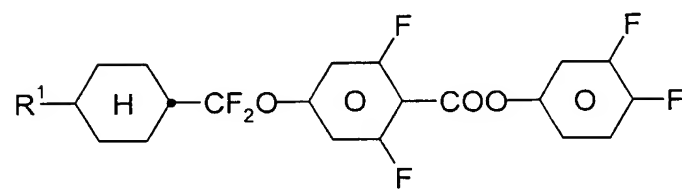






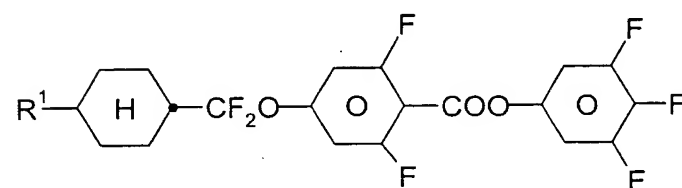
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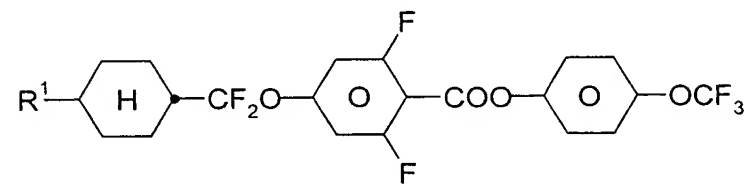
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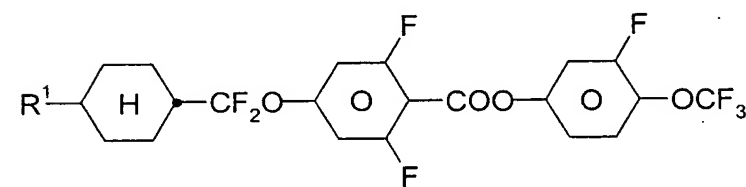
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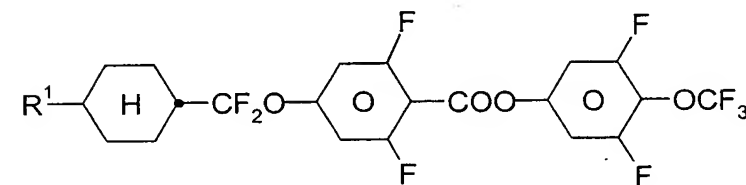
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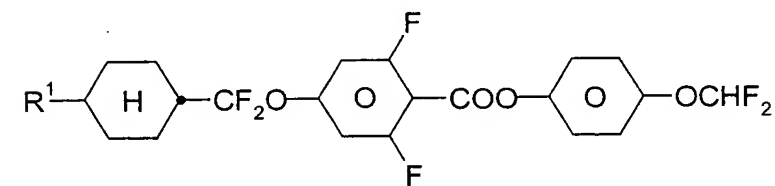
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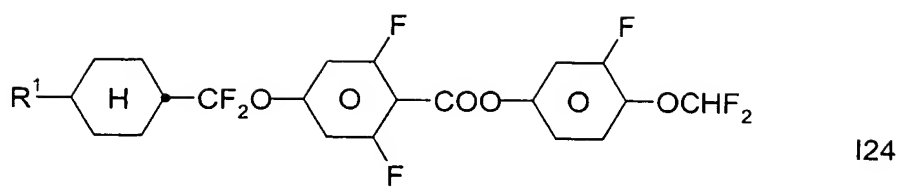
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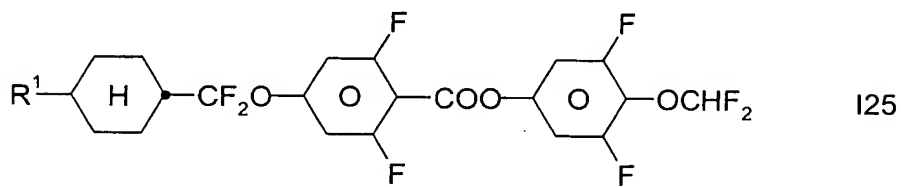


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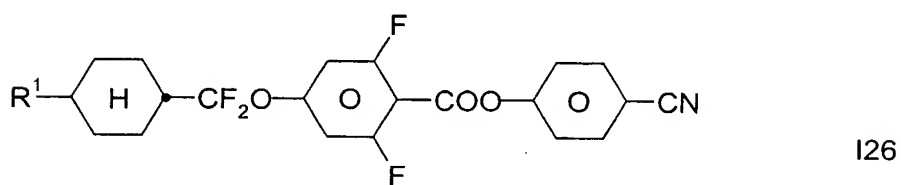
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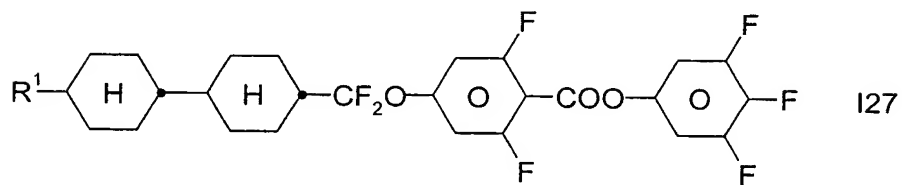
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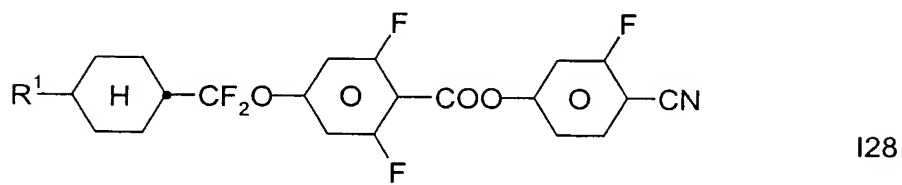
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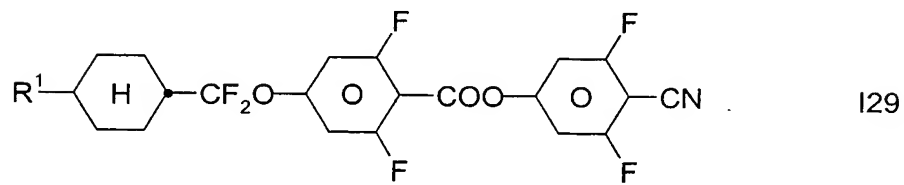
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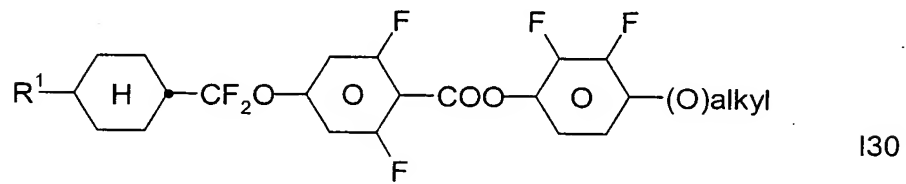
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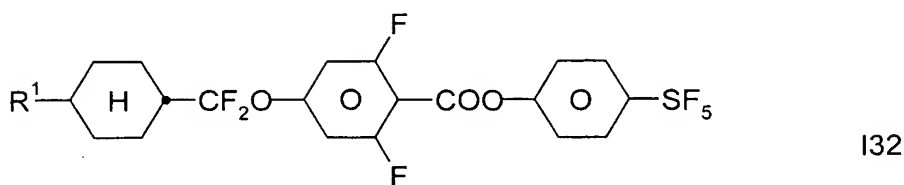
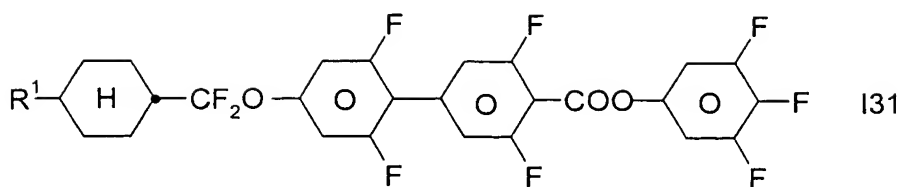
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in which

R^1 is an alkyl radical having from 1 to 12 carbon atoms which is unsubstituted, monosubstituted by CN or CF_3 or monosubstituted to perhalo-substituted by halogen, where one or more CH_2 groups in these radicals, in each case independently of one another, are optionally replaced by $-O-$, $-S-$, , $-CH=CH-$, $-C\equiv C-$, $-CO-$, $-CO-O-$, $-O-CO-$ or $-O-CO-O-$ in such a way that O atoms are not linked directly to one another.

14. An electro-optical liquid-crystal display containing a liquid-crystalline medium according to Claim 1.
15. A display of claim 14, which is an MLC, TN or STN display.
16. A medium according to claim 1, which has a TN threshold below 2.0V.
17. A medium according to claim 1, which has a rotational viscosity at 20°C of <180 mPa·s.
18. A medium according to claim 2, which consists essentially of compounds of the formulae I to VIII.